

MEASURING THE READINESS COST OF ONE-SIZE-SHOE- FITS-ALL PUBLIC POLICY: *A LOOK AT COST-, HYBRID-, AND PRICE-BASED PURCHASING*

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Analysis of these three types of purchasing—price-, cost-, and hybrid-based—shows that a slight tweaking of current policy may produce better results, more in line with commercial buying practices.

The Department of Defense's (DoD's) Acquisition Reform team has fostered many promising reforms during the latter part of the 1990s, including the use of commercial standards, performance-based requirements, integrated product development, cost as an independent variable (CAIV), and greater use of price-based purchasing. While definitive evaluative studies do not yet exist on the effects of these various reforms, the preliminary evidence suggests that greater use of price-based purchasing has been a mixed blessing. The reform has apparently saved the DoD a great deal of money when

used to buy commodities in markets where real competition exists. However, reformers have pushed price-based purchasing into the purchase of custom, noncommercial items produced under noncompetitive conditions, where price-based purchasing may not be the cost-minimizing approach.

The problem with implementing such a far-reaching policy, in general, is that without careful measurement, unintended consequences could occur and go largely undetected. The DoD, and the federal government more generally, have oversight organizations that investigate implementations of specific policies on an *ad hoc*

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basis. The DoD Inspector General (IG) has done at least four audits of the price-based purchasing policy since 1997, uncovering evidence of widespread overpayment by the government for custom, noncommercial items (see referenced DoD IG audit reports, 1998–99). The IG’s contrary evidence is all that is available on these acquisition innovations because the DoD has not systematically measured the performance of different purchasing policies.

The unintended consequence of these policies, price-based purchasing and a lack of systematic measurement, is that the warfighter may be adversely affected through higher prices. With essentially fixed budgets, higher spare part prices translate into fewer spare parts, less fuel, fewer training missions, and an overall

weaker readiness posture. The readiness posture of U.S. forces is inextricably linked to the performance of the DoD’s acquisition practices, including the

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purchase of spare parts. The warfighter currently takes for granted what the acquisition processes produce by not imposing rigorous organizational measures tying acquisition performance to readiness posture.

This research examines the purchase of noncompetitive spare parts for *exactly* the same engine bought by three different organizations using cost-, price-, and hybrid-based purchasing. The Federal Acquisition Regulations (FAR Part 15) provide considerable guidance on cost- and price-

based purchasing and allude to various possibilities for hybrid purchasing schemes depending upon specific circumstances. According to FAR Part 15, cost-based purchasing is the “review and evaluation of the separate cost elements and profit” which comprise the manufacture of an item, and “the application of judgment to determine how well the proposed costs represent what the cost of the contract should be” (FAR Part 15.404-1 [c][1]).

A key strength of this method is that the collected cost information¹ strengthens the government’s negotiating position. Price-based purchasing is the “process of examining and evaluating a proposed price without evaluating its separate cost elements and proposed profit” (FAR Part 15.404-1 [b][1]). It typically involves determination of whether adequate price competition exists. It makes a comparison of proposed prices to catalog prices, historical prices, prices paid by other commercial customers, prices derived from parametric estimates, prices from government cost estimates, and prices derived from any pricing information a contractor may provide (FAR Part 15.404-1 [b]). A key strength of this approach is that the process requires minimal expenditure of labor resources to execute a purchase. The hybrid-based purchasing method is an innovation of one service. It capitalizes on the strengths of the cost- and price-based approaches and will be discussed in greater detail in the research findings.

The data for this study were gathered through site visits to three different locations: two buying locations and the manufacturer. Two DoD sites support the replenishment of one of DoD’s most plentiful, multiservice engines, with a Defense Logistics Agency (DLA) depot purchasing on

a cost basis and a service depot purchasing on a hybrid basis. Their performances are compared to the manufacturer's best commercial customer, where the commercial customer is buying on a price basis.²

Using \$142 million in spare part purchases from samples spread over 5 years, both before and after the implementation of the DoD's price-based purchasing policy, the findings clearly show that cost- and hybrid-based purchasing have resulted in substantial savings for DoD. Across the samples of data, the results show that DoD paid \$157 million less than would the manufacturer's best commercial customer buying on a price basis (DoD paid \$142 rather than \$299 million). If the DoD had purchased these engine parts at commercial catalog prices, as some believe the DoD should, the DoD would have had to pay an additional \$285 million. On the surface, the cost-based approach appears to result in lower cost acquisitions than the hybrid-purchasing approach. However, the real picture may be more complex. Did the service's hybrid-based approach free up labor costs normally devoted to supporting cost-based purchasing? Did hybrid-based purchases deliver other benefits, such as better delivery terms? Did the cost-based approach, while getting DoD the best prices, create a more time- and labor-intensive buying approach? This article explores these issues in greater detail as well.

BACKGROUND

During the past 7 years a spate of reforms in DoD has transformed many acquisition processes, using commercialization as the mantra for many of the changes.

Ironically, in the name of "commercial practices," price-based purchasing is being pushed for buying noncompetitive items, even though purchasing on a cost basis is a common commercial practice in noncompetitive markets (Perrow, 1970; Pfeffer, 1978; Hardy and Magrath, 1987; Burt, 1989; Myer, 1989; Cross, 1995; and Taylor and Wiggins, 1997). This raises questions about the judiciousness of the blanket application of price-based purchasing policy in defense purchasing.

This research extends earlier work by Besselman, Arora, and Larkey (1999, 2000) and Besselman (1998) that predicted price-based purchasing of noncompetitive items would result in greater financial costs to the U.S. Armed Forces. That research provided con-

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siderable quantitative evidence that cost-based purchasing should be the method of choice when buying large quantities of high-value items in noncompetitive markets. To extend that work, a survey of engines was accomplished to identify where cost-based and other methods of purchasing are used to support a single system. It identified a multiservice engine that is sold and supported by one company. The DoD owns a set of engineering drawings, so it sometimes uses secondary sources of supply for a small number of the less complex parts within the engine. Although the manufacturer believes the engine is a commercial item, with more than 50 percent of its part sales to non-DoD customers, the engine's market

consists primarily of militaries of the United States and its allies, both past and present. In a classic economic sense, this engine's market, with one supplier, is not competitive.

The purchase of the spare parts to support this engine by the DoD is accomplished at two locations: a DLA depot and a service depot, although it is a multiservice engine. Until 1996, one service purchased all parts for this engine on a cost basis, both reparable and consumable parts. Since that time, the purchase of consumables was transitioned to a DLA depot. The DLA depot purchases the consumables on a cost-basis while the

service depot transitioned the purchase of reparables to a hybrid-based approach. This split in the support of this singular engine made it possible

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to compare the purchasing methodologies fairly. The use of different methods by the two organizations makes it possible to compare the performance of these methods.

A brief discussion is required to distinguish reparable and consumable spare parts. Repairable spare parts for an engine are typically more complex and expensive on a per-unit basis. These are parts that can be repaired or machined and put back into service. The government typically rewards manufacturers with greater profit for the successful manufacture of more complex items. Complex, reparable engine parts are typically purchased in smaller quantities, thus sometimes negating the

scale efficiencies associated with the manufacture of tens of thousands of consumables such as turbine blades. Within the service depot sample, reparable parts cost on average more than \$5,000 per item. Consumable parts, on the other hand, are bought in large quantities to exploit scale efficiencies, are usually simpler to manufacture, and are typically thrown away or sold for scrap once they have been used. Within the depot samples, consumables cost on average approximately \$60 per item.

RESEARCH APPROACH

We visited the two sites and gathered purchases from on-line databases and contract files. Both organizations were highly professional and cooperative, providing staff experts to help gather the information and answer contextual questions about the purchases. Both sets of the most recent data contained discrepancies that caused the removal of some purchases from the analysis.

The service depot purchases parts using a multiyear blanket purchase agreement (BPA) with the manufacturer.³ The BPA has two tiers of discounts on the catalog prices: 41 percent for the first \$20 million in purchases within a fiscal year and 56 percent for all volume above \$20 million. According to the service depot's buyer, this was intended to collect \$3 million from the DoD to cover field engineering support services provided by the manufacturer.⁴ Therefore, to ensure an apples-to-apples comparison, \$3 million to remove the financial effect of the engineering support from the comparison will adjust the service's aggregate result down.

Although the BPA established set discounts, some purchases had discounts greater and less than the prescribed amounts.⁵

The DLA depot had no such purchasing agreement with the manufacturer. It purchased all of its spares on a cost basis. Purchases by DLA were gathered in two samples from 1997–98 and 1998–99. Since DLA reports its purchases using both in-process and pending quantities, its data were carefully reviewed and only purchases that had been completed were included in the sample.

The analysis of the purchase data follows a very simple approach. Purchases were aggregated and compared to catalog prices and the price paid by the manufacturer’s best commercial customer, where the best commercial customer was buying on a price basis. The percent differences between the aggregate cost for each depot were then compared. Another sample of purchases from the service depot in 1995, prior to the introduction of the price-based purchasing policy, is also incorporated into the analysis. At that time, the service depot was purchasing all spares for that engine, both repairables and consumables, using the cost-based purchasing method.

RESEARCH RESULTS

For this engine, the results clearly show that buying noncompetitive items on a cost and a hybrid basis is vastly superior to price-based purchasing. The DLA data revealed that in 1997–98 and 1998–99, the DoD paid 70 and 68 percent, respectively, below catalog or commercial cost. The price difference is computed by subtracting the commercial cost from the DoD’s cost and then dividing the remainder by the commercial cost. The service depot, however, buying on a hybrid basis, received an average discount of only 63 percent off the catalog price. A summary of these results is provided in Table 1.

The important finding, one the general public does not expect, is that the DoD, regardless of the purchasing approach, significantly outperformed this manufacturer’s best commercial customer, where “commercial” in this sense means a third-party supplier that services primarily foreign governments and the few legitimate commercial users of the engine.⁶ Looking across the samples spanning the past 5 years, the DoD paid \$141.9 million for its spares while the manufacturer’s best commercial customer, buying on a price basis, would have paid more than \$299

Table 1. Summary Results of Engine Purchases^a

	Number Buys	Gov. Cost (\$)	Comm. Cost (\$)	Gov.–Comm. % Difference	Best Comm. Customer (\$)	Gov.–Best % Difference
1995 Service data	71 (cost)	59.3	176.0	–66	123.2	–52
1997–98 DLA data	88 (cost)	32.7	108.1	–70	75.7	–57
1999 Service data	84 (hybrid)	28.0	75.0	–63	52.5	–47
1998–99 DLA data	61 (cost)	21.9	68.0	–68	47.6	–54
Total	304	141.9	427.1	–67	299.0	–53
^a Costs are in millions of dollars.						

million, a savings to the DoD of more than \$157 million.

What if the BPA did not exist and the service depot had to buy the parts on a purely cost basis (using the cost-based purchasing method)? Using DLA's most recent price difference, 68 percent below catalog prices, the service depot could have paid only \$24.1 million rather than the \$28 million paid, a *savings* of approximately \$4 million. Conversely, had the DLA depot used the BPA and received

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only a 63 percent discount, the DLA depot would have paid the manufacturer \$7.6 million and \$3.5 million

more in 1997–98 and 1998–99, respectively. The 1998–99 result will soon grow because DLA had approximately \$20 million more in purchases in the pipeline when these data were being collected.

All else being equal, the purchase of consumables should have been slightly more effective than reparable purchasing since they are simpler components bought in significantly larger volumes. Comparing the 1999 DLA and service data, consumable purchasing was 5 percent more efficient than reparable. Since the purchasing methods were not the same, this difference cannot be attributed solely to the type of item. In the next section we explore these contextual differences.

DISCUSSION OF RESULTS

The findings show clearly that buying noncommercial items on a cost or hybrid

basis results in lower costs than price-based purchasing buying at either commercial catalog prices or at the discount of the manufacturer's best "commercial" customer. In readiness terms, for this one engine, the DoD was able to keep, depending upon one's basis of comparison, \$157 to \$285 million. A transition to price-based purchasing at catalog prices, as some officials advocate for all DoD engines, would have adverse fiscal consequences on readiness.

A lingering issue is whether the DoD performed effectively using the hybrid method in relation to purely cost-based purchasing. The next section further explores their differences and results.

PURCHASING METHODS

In theory, cost-based purchasing offers a significant advantage. It allows a buyer with significant buying power in a market to be near the informational level of the seller. The buyer with market power demands and receives cost information. Armed with good cost information, the buyer can negotiate a price that holds down the seller's profit.

Discussions with government and industry personnel reveal that cost-based purchasing also has its disadvantages. It is typically time- and labor-intensive for the buyer. Indeed, interviews with buyers as part of this research reveal that time delays have increased after the Federal Acquisition Reform Act of 1996 (FARA), because many industrial suppliers are trying to have markedly noncommercial items declared commercial via a "commercial catalog." If an effort is truly commercial or a contractor is successful in persuading a buyer that it is commercial, then the government is prevented from

collecting cost data, no matter how expensive the item may be. These efforts by industry, some dubious,⁷ delay negotiations while the government determines whether the item is truly commercial. Delaying negotiations can have adverse consequences on readiness, as operational units may have to wait on an item. Another labor-intensive feature is the typical on-site review of the contractor's data and manufacturing processes.

From an industry perspective, a disadvantageous feature is the requirement that the contractor certify "to the best of its knowledge and belief, the cost or pricing data were accurate, complete, and current" [FAR Part 15.403-4 (b)(2)]. It can be further time- and labor-intensive (expensive) for industry if the contractor is also required to convert its data to government-specified formats. These factors imply that the government carefully consider purchasing circumstances before imposing a purchasing method.

Price-based purchasing also offers several advantages:

- It can be accomplished very quickly (publish a requirement and solicit prices from vendors).
- It uses minimal labor resources.
- Competition, rather than negotiation, is used to control prices.

It may require market research and the collection of commercially available cost information, but its transaction costs are typically trivial compared to what it costs to collect and analyze cost information. In both the public and private sector, price-based purchasing is the typical purchase method when buying items competitively

available and widely used in the commercial sector.⁸

The major disadvantage of price-based purchasing is that the buyer is at a significant informational disadvantage without real competition. In many markets, meaningful cost information, whether certified or not, is simply nonexistent. Classical economic theory requires lots of suppliers for true competition. As a practical matter, there should be at least a half dozen suppliers to select from (Bresnahan and Reiss, 1990, 1991). Once bids have been received or prices surveyed, contract award is accomplished with the most advantageous firm.

The process quickly breaks down, however, if there are only a couple of suppliers. Although economic theory suggests that a single customer facing more than one supplier can drive the price down to marginal cost, economic theory also points to the possibility of tacit collusion when the

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number of suppliers is small. Further, even if the buyer can drive the price, if there is uncertainty about the costs of the suppliers, economic theory suggests that the buyer can do better if he has cost information rather than simply relying upon prices (See Baron and Meyerson, 1982; Grossman and Hart, 1983). One or occasionally two suppliers and one customer is the typical circumstance for the DoD purchasing custom parts and equipment for weapon systems.⁹

The service depot used hybrid-based purchasing, an approach developed to exploit the advantages of cost- and price-based purchasing.¹⁰ They selected a group of parts (reparables) from a manufacturer's commercial price list with the intent of putting in place a BPA for those parts. In this case, the BPA is nothing more than an agreement by one government agency with a manufacturer to purchase parts at either set prices below or at a uniform discount off of a manufacturer's commercial price list. The depot then in-

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vested a small amount in labor to analyze certified cost and pricing data they had previously collected for a

sample of these same parts. That analysis determined an appropriate catalog discount equivalent to historical prices based on cost and pricing data. That analysis provided an anchor for negotiations. They now had sufficient knowledge to negotiate a fair discount on the manufacturer's catalog prices, one that pays a fair profit. In the future, they intend to collect cost and pricing data for a statistically valid sample of the parts to either revalidate the discount or negotiate a new discount.

The buyers and engine managers believe the hybrid-buying approach engenders trust between the government and manufacturer by increasing "contracting velocity," the speed at which a buyer contracts for an item, while also giving the government the opportunity to verify. The trust arises through government and contractor teamwork, using minimal labor, with very little contractor disruption. Cost

data is collected on a small, representative sample of parts rather than every single item the government may purchase out of a catalog. This saves the government and contractor time and labor. Verification occurs by basing the discount on cost data for a statistically representative sample of items in the contract or catalog. One could label the hybrid approach the "trust but verify" theory of negotiation. Once in effect, the BPA then delivers the strengths of price-based purchasing: quick, easy purchases with commercial delivery terms.

LABOR

Using the most recent results, the service depot, using the hybrid method, was approximately 5 percent less efficient purchasing than the DLA depot. Are there intangibles in hybrid-based purchasing that make it the better option, despite the greater transaction cost involved? A major consideration should be the possible reduction in labor charges from not having to collect and analyze cost and pricing data, both for the manufacturer and DoD, and negotiate each individual contract. In this case, there could have been 84 separate contract actions had the service depot not established the BPA. In actuality, there have been no savings from not having to collect cost and pricing data for these purchases. First, the Defense Contract Audit Agency (DCAA) unit did not downsize as a result of the BPA. Second, the manufacturer already possesses a sophisticated activity-based cost accounting system that tracks costs rigorously, whether or not cost and pricing data are requested by DoD.

Not having to negotiate 84 separate contract actions certainly reduced labor

costs. But these cost savings are substantially less than the \$4 million “loss” the service depot experienced by not using cost-based purchasing. A contracting officer and four buyers could have accomplished the 84 contractual actions. Assuming a generous labor cost of \$200,000 per staff year, the total labor bill would only reach \$1 million, far below the estimated \$4 million “loss.”

MORE FAVORABLE TERMS

Another consideration is whether DoD earned more favorable terms through the use of the BPA. The BPA’s delivery terms and lead-time requirements are right out of the commercial catalog, so there is no additional benefit. Furthermore, if delivery requirements are shorter than the product’s lead time, the service depot must pay the catalog price. Even when the DLA depot violated the manufacturer’s lead-time requirement buying on a cost basis, they paid a price near or above the catalog price on only one occasion. In effect, the DLA depot buying on a cost basis enjoyed better delivery terms than the service depot.

EMERGENCY BUYS

One area of concern with the cost-based buying done by the DLA depot is the frequency of emergency buys. These are buys made in small quantities and typically at considerably higher prices to meet a near-term demand. This can occur because the depot was notified about the requirement either too late by the item manager or its buying process took too long because of some inefficiency. Although it looks bad for the DoD to pay \$70 for a turbine blade that normally costs \$19 because of poor planning or execution of

the buy, the overall effect in this case is not severe since the quantities are so small. If the emergency buys were removed from the 1998–99 DLA depot sample, DLA purchasing would improve by only one-half of one percent. However, if that small percentage difference were applied to the dollar volume across several engines, this inefficiency could pose an adverse impact on readiness dollars. Therefore, the DLA and service buyers should endeavor to eliminate emergency buys.

The missing part of this analysis is whether there was an adverse readiness effect because a part was not in the field when it was needed. It takes time to buy on a cost basis.

Were missions scratched because the buying processes were taking too long? In talking

“It takes time to buy on a cost basis.”

with the engine’s manager, this indeed happens, although not nearly as often as it did back in the 1997–98 time frame. This is another hazard of not having pervasive organizational measures for the leadership to assess the costs and effectiveness of the buying. The warfighter needs to rigorously oversee this process to ensure purchases occur on time and mission execution is not adversely affected. This is the thread inextricably linking acquisition and readiness.

LEAN MANUFACTURING

A near-term extension to this research will compare changes in real prices over time. At this manufacturer’s facility, a significant manufacturing improvement program was undertaken throughout the early 1990s. The DoD underwrote a portion of

this modernization through the payment of higher prices with the promise that prices would begin to fall in the late 1990s. Although inflation has not been a factor in the markets supplying this manufacturer; on an anecdotal basis, prices have continued to rise. This is a concern considering the degree of innovation that has occurred on the manufacturing floor.

This manufacturer has aggressively pursued innovations commonly referred to as lean manufacturing. For example, a

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major manufacturing cost driver is the length of the manufacturing line. This engine's line has been reduced from more than two miles down to less than a

half mile. In most normal commercial markets, particularly when items are manufactured over many years, there is a learning curve that continually drives down costs and consequently prices. At this site, the DoD has not reaped any of these savings. This is something the DLA and service depot should examine on an amicable fact-finding basis. The intent should be to understand why the manufacturer has not returned any savings, rather than to put profit pressure on the manufacturer, adversely affecting its financial health.

CONCLUSIONS

This research is neither an indictment of price-based purchasing nor a confirmation

that the DoD should revert back to cost-based purchasing for all or most of its buying. On the contrary, price-based purchasing should be the method of choice for most of what the DoD buys: commercial items bought in competitive markets. But like large commercial firms with significant market buying power, DoD should exploit cost-based purchasing or the hybrid method when acquiring noncommercial items of significant dollar value in noncompetitive markets. This modest tweaking of the current policy would put the DoD more in line with commercial buying practices.

The service depot and other organizations should continue to refine the hybrid method. Although the hybrid method was slightly more inefficient (5 percent) from a cost perspective, the service depot believes that was more than overcome by awarding contracts quickly and easily, for both the government and manufacturer. In reality, considering the service depot was buying more complex components in smaller quantities, we expected their performance to suffer slightly, perhaps by a few percentage points. Nevertheless, the service depot should collect cost and pricing data for a statistically representative sample of the parts they seek to put on contract. The depot should follow this up by spot checks to minimize the presence of expensive outliers.

The DLA depot should carefully consider these findings and the benefits they perceive from purely cost-based buying. The service depot has demonstrated that it can get within 5 percent of DLA's performance using the much simpler and more timely hybrid approach. The service depot could easily extend the BPA to account for all parts supporting this engine

and free up valuable DLA labor resources. A single BPA for all parts for both DoD organizations would be a win-win formula for government and the manufacturer.

Other part managers, particularly managers of noncommercial items or systems, should take a hard look at the hybrid approach. If one collects cost data on statistically valid samples, one should be able to arrive at discounts for subsets or entire catalogs that rival discounts received by using cost-based purchasing uniformly. This approach should free up valuable depot, DLA, and Defense Contract Audit Agency labor resources and significantly increase the velocity of our purchasing.

This research highlights the most pervasive commercial practice that continues to elude the DoD: rigorous and widespread organizational measurement. In the

DoD, organizational measurement within and across much of what is called defense purchasing is not presently required. An organizational measurement initiative comparing the military services, buying sites, internal organizations, and weapon system offices would enable the leadership to more effectively guide defense procurement toward genuine process improvement. This research's simple organizational measurement exercise showed that a \$157 to \$285 million adverse impact on readiness could have occurred if the buyers in the field had simplistically implemented a price-based purchasing policy. Readiness, in general, however, will continue to suffer from inefficient purchasing until the leadership embraces coherent and pervasive measurement across its logistics and acquisition enterprise.



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REFERENCES

- DoD Office of the Inspector General. (1998, October 13). *Sole-source prices for commercial catalog and noncommercial spare parts* (Audit Report 98-088).
- DoD Office of the Inspector General. (1998, June 24). *Commercial and noncommercial sole-source items procured on contract N000383-93-G-M111* (Audit Report 98-064).
- DoD Office of the Inspector General. (1999, January 13). *Commercial spare parts purchased on a corporate contract* (Audit Report 99-026).
- DoD Office of the Inspector General. (1999, October 12). *Sole-source non-commercial spare parts orders on a basic ordering agreement* (Audit Report 99-218).
- DoD Office of the Inspector General. (1999, August 16). *Sole-source commercial spare parts procured on a requirements type contract* (Audit Report 99-217).
- Besselman, J. (1998). *Purchasing performance: A public versus private sector comparison of commodity buying*. Ph.D. dissertation, Carnegie Mellon University, Pittsburgh, PA.
- Besselman, J., Arora, A., & Larkey, P. D. (1999, Fall). Purchasing performance: A public versus private sector comparison of commodity buying. *Acquisition Review Quarterly*, 6(4), pp. 333–353.
- Besselman, J., Arora, A., & Larkey, P. D. (2000, September-October). Buying in a businesslike fashion: And paying more? *Public Administration Review*.
- Blair, R. D., & Harrison, J. L. (1993). *Monopsony*. Princeton, NJ: Princeton University Press.
- Bresnahan, T. F., & Reiss, P. C. (1990, October). Entry in monopoly markets. *Review of Economic Studies*, 57(4), pp. 531–533.
- Bresnahan, T. F., & Reiss, P. C. (1991, October). Entry and competition in concentrated markets. *Journal of Political Economy*, 99(5), pp. 977–1009.
- Burt, D. N. (1989, July-August). Managing suppliers up to speed. *Harvard Business Review*, pp. 127–135.
- Baron, D., & Meyerson, R. (1982). Regulating a monopolist with unknown costs. *Econometrica*, 50, pp. 911–930.

- Cross, J. (1995, May-June). IT outsourcing: British Petroleum's competitive approach. *Harvard Business Review*, pp. 94-102.
- DoD. *Federal Acquisition Regulations. Parts 15 and 13*. Washington, DC: Author.
- Gansler, J. S. (1978). *The diminishing economic and strategic viability of the U.S. defense industrial base*. Ph.D. dissertation, American University, Washington DC.
- Gansler, J. S. (1982). *The Defense Industry*. Cambridge, MA: The MIT Press.
- Grossman, S. & Hart, O. (1983). An analysis of the principal-agent problem. *Econometrica*, 52, pp. 194-206.
- Hardy, K. G., & Magrath, A. J. (1987, September-October). Buying groups: Clout for small businesses. *Harvard Business Review*, pp. 16-24.
- Myer, R. (1989, November-December). Suppliers—manage your customers. *Harvard Business Review*, pp. 160-168.
- Peck, M. J., & Scherer, F. M. (1962). *The weapons acquisition process: An economic analysis*. Boston: Harvard Business School Division of Research.
- Perrow, C. (1970). *Organizational analysis: A sociological view*. Belmont, CA: Wadsworth.
- Pfeffer, J. (1978). *The external control of organizations*. New York: Harper and Row.
- Williamson, O. E., (1985). *The economic institutions of capitalism: Firms, markets, relational contracting*. New York: The Free Press.

ENDNOTES

1. Cost information is little more than a decomposition of the unit price, revealing the various constituents such as materials, labor, anticipated profit, and possibly the cost of money. It can be highly variable and the government, unlike the commercial sector, may require a contractor to certify the information, which can introduce legal consequences should the vendor misrepresent its costs. While some large commercial companies may require certified cost data, the only potential penalty from misrepresentation is that the buyer may take his or her future business elsewhere.
2. These sites as well as the specific engine will not be identified. A precondition for gaining access to some of this data was that the manufacturer would not be identified so that their proprietary information, the discount their best commercial customer pays, would not be publicly revealed, particularly to their other customers. Confidentiality is a common feature in DoD acquisition research and can be found in seminal works by such distinguished researchers as Peck and Scherer (1962) and Gansler (1978, 1982).
3. A BPA is not a contract; rather, it is more of a charge account with qualified source(s) of supply to fill.
4. The field engineering support for \$3 million was provided to the field in anticipation of problems. Adding 15 percent to the first \$20 million in spare part purchases was viewed as an efficient means of collecting the money and paying for services that were typically difficult and time consuming to contract for. No longer did the item manager have to contract individually when a crisis or problem developed in the field. He could now immediately deploy contractor resources to fix problems. In effect, contracting velocity (speed at which a contract is put in force) is significantly increased and customer wait time lowered. This is similar to contracts used by some airlines. Besselman (1998) identified one major commercial airline that buys parts and services for at least one engine in this manner.
5. Although the item manager, buyer, and contracting officer could not explain this discrepancy, it does not materially change the final results.
6. In the aggregate, the DoD is the largest buyer, but the majority of part sales go to non-DoD buyers. The volume of purchasing by the largest commercial customer is comparable to one of the DoD's individual depots.

7. Some contractors will go to great lengths to have an item declared commercial. During a fall 1999 visit to a depot, one reputable firm was attempting to use sales of military parts to mercenaries on the African continent as evidence of “commercial sales.”
8. One of today’s widely held urban legends is that there is one way the commercial sector does something. Purchasing is no exception. We have seen suppliers to a large retailer and fast food chain provide cost visibility into such commercial items as baby clothing and ground beef and other ingredients, respectively.
9. Monopsony, the case of only one customer, is analogous to monopoly. Thus, in a monopsony, the buyer can usually do better by gathering information about the cost of production, but only by introducing inefficiencies (e.g., see Blair and Harrison, 1993). We suggest using price-based purchasing even when DoD is the only customer as long as many firms supply the item under competitive conditions.
10. This technique is nearly identical to an approach DLA pioneered with Honeywell and showcased at the 2000 Acquisition and Logistics Reform Week, Washington, DC, May 22–26, 2000.

Transaction costs are typically costs of contracting with third parties (e.g., see Williamson, 1985). In this case, these costs include the cost of collecting and analyzing cost data and negotiating contracts.

